Hazardous Materials Transportation Training Modules

VERSION 5.0

STUDENT

Carrier Requirements (Water)

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

MODULE 6D

Script

Visual	Narrative

1

This module is based on Part 176 of the HMR and covers the requirements for accepting and/or transporting hazardous materials by most commercial vessels, foreign or domestic, when in the navigable waters of the United States. Exceptions are found in §176.5(b). Part 176 requirements for vessel transportation are in addition to those contained in Parts 171, 172, and 173 of the HMR.

2

After completing Module 6D on the Carrier Requirements for the Water lesson, you should be able to:

- Summarize general operating requirements, as well as general handling, stowage, and segregation requirements for transporting hazardous materials by commercial vessels.
- Define special requirements for transport vehicles and barges.
- Recognize segregation requirements for specific classes of hazardous materials and highlight any exceptions to those requirements.
- Compare the uses of the International Maritime Dangerous Goods Code for similarities to and differences from the uses of the hazardous materials regulations (HMR).
- Identify and apply the incident reporting requirements in 49 CFR.

3

You may use the International Maritime Dangerous Goods Code when carrying hazardous materials by vessel, as long as you also follow the requirements listed in §171.12 and §176.11 of the HMR.

4

Part 176 is divided into Subparts A through O:

- Subparts A through D provides general information and operating requirements, as well as general handling, stowage, and segregation requirements.
- Subparts E and F provide special requirements for transport vehicles and barges loaded with hazardous materials.
- Subparts G through O provide detailed requirements for specific classes of hazardous materials.

5

Definitions for the terms used in Part 176 are given in §176.2. Familiarity with these terms is important in properly applying the regulations in this part. Spend some time looking at these definitions in §176.2 now.

6

Each carrier must ensure that its employees involved in the transportation of hazardous materials are trained in accordance with the HMR, Part 172, Subpart H. The record of training required by §172.704(d) must be kept on board the vessel while the crewmember is in service on board the vessel.

7

All hazardous materials must be prepared for transportation in accordance with Parts 172 and 173 of the HMR before they can be transported by vessel. Explosives forbidden under §173.54 may not be transported by vessel.

8

Professor Fed's Knowledge Check 1

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

171 172 173 176 IMDG ICAO

1. The _____ Code may be used instead of the 49 CFR if the shipment also meets the requirements in §171.12 and §176.11.

2. The Carrier Requirements (Water) module discusses requirements for accepting and/or transporting hazardous materials by vessel as found in the HMR, Part _____.

3. The HMR, Part _____, and Part 176, requires carriers to train each Hazmat employee.

9

You may not transport hazardous materials by vessel unless they are properly described and certified on the shipping paper as set forth in Part 172.

10

At the time a freight container or transport vehicle containing hazardous materials is offered for transportation by vessel, the person responsible for packing or loading it must give the vessel operator a signed container packing certificate stating the container or transport unit is serviceable for the material loaded therein; it contains no incompatible goods; that it is properly marked, labeled, and placarded as applicable; and the packages contained within the container have been properly inspected, marked, labeled or placarded, and secured, and are not damaged. The signed certification may be on the shipping paper or on a separate document stating that the packing of the container has been carried out in accordance with the provisions of 49 CFR 176.27(c) and/or the IMDG code. Sample wording can be found in §176.27(c). The container packing certification statement is in addition to the shipper's certification in §172.204.

11

The term stowage as used in this lesson refers to where a cargo may be located on the vessel and how it is secured. The term segregation refers to a separation of hazardous cargo from other hazardous cargoes by distance or barriers. Stowage and segregation are critical on a vessel because of the forces and stresses that affect it while it is underway. Rotational and linear forces can cause shifts of cargo that can result in significant damage.

12

The carrier must prepare a dangerous cargo manifest, list, or stowage plan for materials subject to the requirements of 49 CFR or the IMDG Code. A list of the information required is shown here. You must keep this document in a designated holder on or near the vessel's bridge. Each carrier must retain a copy of the dangerous cargo manifest for at least one year.

13

After stowage is complete, the carrier must inspect each hold or compartment containing hazardous materials, to ensure that stowage has been accomplished properly and that there are no visible signs of damage. The carrier must inspect again after periods of heavy weather, and, unless the vessel is equipped with smoke- or fire-detecting systems with automatic monitoring capability, every 24 hours.

14

If an accident occurs on board a vessel damaging hazardous materials packages, then damaged or unauthorized packagings may be used on an emergency basis only, but may not be offered to any forwarding carrier for transportation. The master of the vessel must request instructions for disposition of the packages from the nearest United States Coast Guard Captain of the Port (COTP). The master of the vessel may decide to jettison hazardous materials only to prevent or substantially reduce a hazard to human life or reduce a substantial risk to property.

15

A carrier may not transport by vessel any damaged package containing hazardous materials that appears to have leaked or may leak. Packages may be repaired or restored to the satisfaction of the master of the vessel. A package containing radioactive materials (other than low specific activity), may not be repaired or restored.

16

A carrier may not knowingly transport by vessel any hazardous material offered under a deceptive name, marking, invoice, or shipping paper. If a shipment is found to be in violation while in transit, the master of the vessel must take whatever measures are necessary to ensure the safety of the vessel, its passengers, and its crew. If the vessel is in port, the carrier may not deliver the shipment to any party, and the master must immediately request instructions for disposal of the material from the nearest Captain of the Port.

17

The carrier must not repair a vessel containing hazardous materials using welding, burning, or power-actuated tools and appliances that may produce intense heat, unless the emergency repairs are necessary for safety reasons, or the work has previously been approved by the Captain of the Port.

18

Professor Fed's Knowledge Check 2

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

unauthorized	certificate	damaged	carrier
stowage	bridge	emergency	segregation

1. Damaged packages containing hazardous materials may be contained in _____ packaging, only in emergency situations.

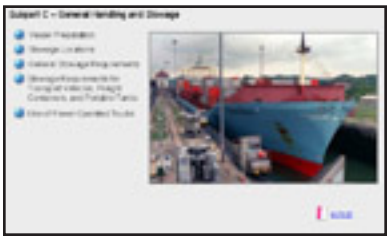
2. Each person who offers hazardous materials for transportation must provide a signed container packing _____ stating that the packing of the container complies with the HMR.

3. Packages that are _____ or have leaked may not be accepted by the carrier for transportation by vessel.

4. Damaged packages containing hazardous materials may not be offered to any forwarding _____ for transportation.

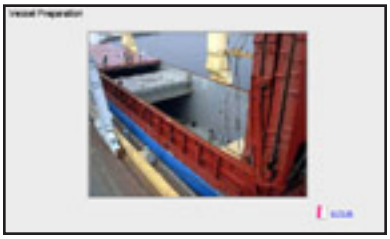
5. Where hazardous cargo is located on the vessel and how it is secured is termed _____.

19



You may handle or stow hazardous materials on board a vessel only under the direction and observation of a responsible person who has been assigned this duty. On domestic vessels, this person must be a licensed officer assigned to the vessel, except it may also be an employee of the carrier when the vessel is engaged in a coastwise voyage or on rivers, bays, sounds, or lakes. On a foreign vessel, the responsible person must be an officer of the vessel. Click on the buttons to learn more. The "General Stowage Requirements" button also links you to information on break-bulk and marine pollutant stowage.

20



Before you may stow hazardous materials on board a vessel, each hold or compartment must be free of debris. This requires examination of the bilges to ensure that residue from previous cargo has been removed.

21

Column 10 of The Hazardous Materials Table, or HMT, in §172.101 contains specific information relating to authorized vessel stowage locations. Column 10A, Vessel stowage, Location, specifies the authorized stowage locations on board cargo and passenger vessels. They are defined in §172.101(k). Column 10B, Vessel stowage, Other, specifies codes for vessel stowage requirements for specific hazardous materials. The meaning of each code found in Column 10B is defined in §176.84. Also note that Column 7 of the HMT specifies codes for special provisions applicable to hazardous materials. The "W" codes, in particular, only apply to transportation by water. The meaning and requirements of each special provision is found in §172.102

18

Professor Fed's Knowledge Check 3

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Look up Nitrous oxide, refrigerated liquid, in the HMT. Looking at the entry in Column 10A, we find the stowage category code "B". Referring to §172.101(k)(2)(i) and (ii), we read that this hazardous material may be carried on a cargo vessel or a passenger vessel, but that the stowage location on a passenger vessel depends on the number of passengers. Moving over to Column 10B, we see the entry "40". Based on, the Table of Provisions, of §176.84(b) what does the entry "40" denote?

A. Stow "away from" foodstuffs.
B. Stow "clear of living quarters".
C. Stow "away from" hydrazine.
D. Stow "away from" oxidizers.

23

If the prescribed stowage location is shown to be impractical for a vessel, the Captain of the Port may authorize in writing an alternative stowage location or method of segregation as long as it will afford the same level of safety.

24

Hazardous materials must be stowed in a manner that will facilitate inspection during the voyage, removal from a potentially dangerous situation, and removal in case of fire. If a package contains liquid hazardous materials, it must have orientation markings on it and be stowed with the markings pointing up.

25

You must properly stow and secure marine pollutants to minimize the hazards to the marine environment without impairing the safety of the ship and the people on board.

26

You may not use a metal bale hook to handle any packages of hazardous materials. You may not use equipment designed to lift or move cargo by means of pressure exerted on the package, if the package was not designed to be moved in that manner, or if it could cause damage to the package. Other equipment used must supply adequate support to the packages to prevent them from falling during loading.

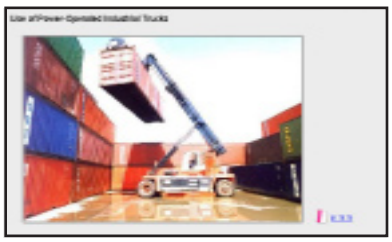
27

Shown here are guidelines pertaining to the stowage of hazardous materials on decks of vessels.

28

When carrying transport vehicles, freight containers, and portable tanks containing hazardous materials by vessel, additional conditions including those shown here must be met.

29



Power-operated trucks or cargo handling vehicles, like forklifts, must conform to the requirements of §176.78 before they may be used on board a vessel in a space containing hazardous materials. Truck ratings and special operating conditions are designated in §176.78, with minimum safety features identified in §176.78(f).

30

Professor Fed's Knowledge Check 4

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

debris	water	radiation	orientation	172.101
50%	40%	secured	wrapped	176.78

1. Each hold or compartment must be free of _____ before hazardous materials may be stowed there.

2. A package containing liquid hazardous materials must have _____ markings and be stowed in the indicated position.

3. No more than _____ of the open deck area should be used for stowage of hazardous materials.

4. When carrying transport vehicles or freight containers containing hazardous materials, all packages within the vehicle must be _____ to prevent movement in any direction.

5. Forklifts must conform to the requirements of _____ before they may be used on board a vessel in a space containing hazardous materials.

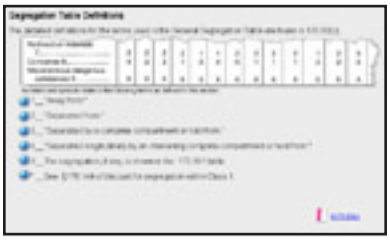
31

General requirements for segregation are found in Part 176, Subpart D. When you stow hazardous materials together, you must segregate them according to the General Segregation Table found in §176.83(b). Additional requirements for segregation are found in Column 10B of the Hazardous Materials Table 172.101. Additional notes for Class 1 (explosive) materials can be found in §176.84(c)(2). If the requirements differ, you must use the most restrictive segregation requirements.

32

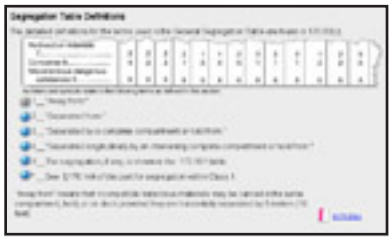
You use the General Segregation Table by finding one class of material in the vertical column, and then finding another class by horizontal row. The intersection of the vertical column and the horizontal row contains a number or symbol that represents the method of segregation that you must use between the two classes. The terms associated with these numbers and symbols are listed at the bottom of the table.

33



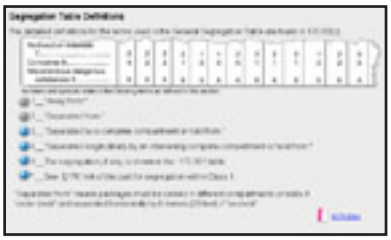
Click on each button to learn more about what is required under each of the four primary segregation requirements.

34



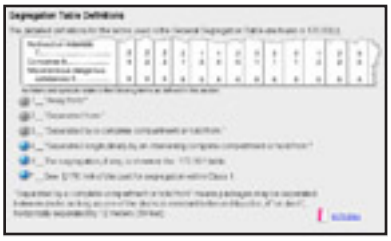
"Away from" means that incompatible hazardous materials may be carried in the same compartment, hold, or on deck provided they are horizontally separated by 3 meters (10 feet) .

35



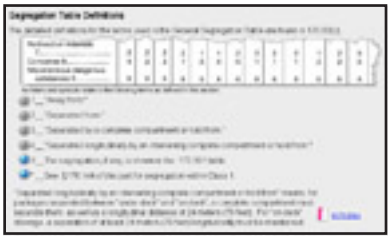
"Separated from" means packages must be carried in different compartments or holds if "under deck" and separated horizontally by 6 meters (20 feet) if "on deck."

36



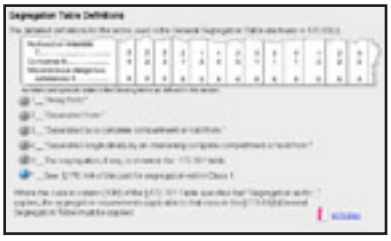
"Separated by a complete compartment or hold from" means packages may be separated between decks as long as one of the decks is resistant to fire and liquid or, if "on deck," horizontally separated by 12 meters (39 feet).

37



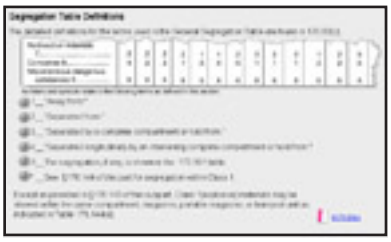
"Separated longitudinally by an intervening complete compartment or hold from" means, for packages separated between "under deck" and "on deck", a complete compartment must separate them, as well as a longitudinal distance of 24 meters (79 feet). For "on deck" stowage, a separation of at least 24 meters (79 feet) longitudinally must be maintained.

38



Where the code in column (10B) of the §172.101 Table specifies that "Segregation as for…" applies, the segregation requirements applicable to that class in the §173.83(b) General Segregation Table must be applied.

39



Except as provided in §176.145 of this subpart, Class 1 (explosive) materials may be stowed within the same compartment, magazine, portable magazine, or transport unit as indicated in Table 176.144(a).

40

Professor Fed's Knowledge Check 5

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Look up Hydrogen, compressed in the HMT, 172.101. Take special note of the hazard or division class in column 3 and any numbers in column 10 B. Now do the same thing for Kerosene. Again, take special note of the hazard or division class in column 3 and any numbers in column 10B. Now use the General Segregation Table to determine the required segregation requirements. How should Hydrogen, compressed and Kerosene be segregated?

A. 1 – "Away from."
B. 2 – "Separated from."
C. 3 – "Separated by a complete compartment or hold from."
D. 4 – "Separated longitudinally by an intervening complete compartment or hold from."

41

Separate segregation tables govern freight containers on board container vessels and transport units carried on board trailerships and trainships. Click on the buttons to view these segregation tables.

42

(Display of Table 176.83(f) Segregation Of Containers On Board Container Ships)

43

(Display of Table 176.83(g) Segregation Of Transport Units On Board Trailerships and Trainships)

44

The person in charge of a transport vehicle containing hazardous materials must provide to the vessel's representative a copy of the shipping papers required by §176.24 and certification stating that the hazardous materials were prepared in accordance with the HMR as required by §176.27. A transport vehicle, a private automobile, or a motorboat containing hazardous materials may be transported on board ferry vessels subject to the conditions found in Part 176, Subpart E.

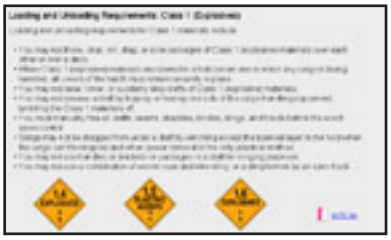
45

You may transport packaged hazardous materials on a barge, provided the barge is constructed of steel, and is not a dump scow. You may need a permit from the Captain of the Port (COTP) to carry certain hazardous materials. Refer to §176.99 for a list of these materials. A barge loaded with these materials, while being placed on, removed from, or handled on board a barge-carrying vessel, is not subject to these permits. Barges carried on board barge-carrying vessels must be stowed in accordance with the requirements in §176.77.

46

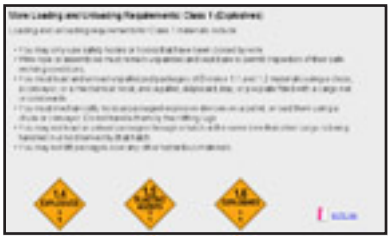
Before Divisions 1.1 and 1.2 may be discharged from or loaded on board a vessel in the United States, the Carrier must obtain a permit from the COTP. The COTP may assign a US Coast Guard supervisory detail to any vessel during loading, handling, or unloading Class 1 (explosive) materials.

47



§176.104 list specific points concerning the loading and unloading of Class 1 (explosive) materials.

48



Loading and unloading requirements for Class 1 materials include:

- You may only use safety hooks or hooks that have been closed by wire.
- Wire rope or assemblies must remain unpainted and kept bare to permit inspection of their safe working conditions.
- You must load and unload unpalletized packages of Division 1.1 and 1.2 materials using a chute, a conveyor, or a mechanical hoist, and a pallet, skipboard, tray or pie plate fitted with a cargo net or sideboards.
- You must mechanically hoist unpackaged explosive devices on a pallet, or load them using a chute or conveyor. Do not handle them by their lifting lugs.
- You may not load or unload packages through a hatch at the same time that other cargo is being handled in a hold served by that hatch.
- You may not lift packages over any other hazardous material.

49

A responsible person who is aware of the hazards involved in handling Class 1 (explosive) materials and the steps to be taken in an emergency must be in constant attendance during loading, unloading and stowage of Class 1 (explosive) materials, including the preparation of the holds.

50

§176.116 set forth general stowage conditions for Class 1 (explosive) materials. They include keeping this material away from heat sources, dry, secured and fully braced.

51

Electrical equipment and cables in compartments where Class 1 (explosive) materials are stowed must be disconnected from the power source or, if energized, must meet minimum requirements for grounding and safety defined in 46 CFR, Subchapter J, Chapter I.

52

Ordinary stowage is authorized for most explosive articles carried by vessel except those requiring “magazine” or “special” stowage.

53

Magazine stowage is required for all explosive substances except for “Explosive Substances, n.o.s.” in compatibility groups G, L, or S. A compatibility group is designated by a letter used to categorize explosive substances and articles for purposes of stowage and segregation. Table 1 in §173.52 contains a description for each compatibility group.

54

Magazine stowage is sub-divided into three different types of magazines designated by the letters A, B, and C. Click each button to learn more about these three types of magazine stowage.

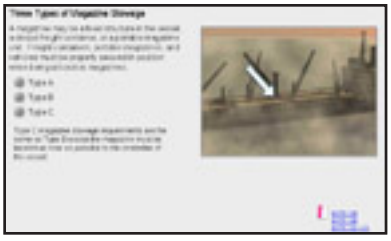
55

Type A magazine stowage guards against friction between any spilled contents of packages and the vessel's sides and bulkheads. The magazine must be tightly sheathed with wood on its inner sides and floor. When utilized as part of the magazine structure, the vessel's sides and bulkheads must be clean, free from rust or scale, and protected by battening or sweatboards. Type A stowage is required for explosive substances that must be kept clear of steelwork.

56

Type B magazine stowage is the same as Type A except the floor must be sparred or protected by wooden pallets or dunnage instead of sheathed in wood. Also, battening of the vessel's sides, bulkheads, and stanchions is not required.

57



Type C magazine stowage requirements are the same as Type B except the magazine must be located as near as possible to the centerline of the vessel.

58

You may use closed transport vehicles as magazines to transport Class 1 (explosive) materials by vessel, if they meet the requirements of the appropriate magazine stowage type and any additional requirements listed in §176.168.

59

Special stowage is required for certain articles presenting both explosive and chemical hazards. §176.136 list stowage requirements for specific Class 1 (explosive) articles and substances. Summaries are shown here.

60

Each portable magazine used for the stowage of Class 1 (explosive) materials on board vessels must meet the requirements summarized here and explained in detail in §176.137.

61

You may not stow Class 1 (explosive) materials within a horizontal distance of 6 meters (20 feet) of any fire, machinery exhaust, galley uptake, locker used for combustible stores, or other potential sources of ignition, or within 8 meters (26 feet) of the bridge, accommodation areas, and lifesaving appliances. Freight containers containing Class 1 (explosive) materials may be overstowed by containers of compatible Class 1 (explosive) materials or non-hazardous cargo only on vessels fitted with container fastening arrangements. Where vessels are not fitted with container fastening arrangements, freight containers loaded with Class 1 (explosive) materials may only be stowed on the bottom tier of the stowage.

62

Professor Fed's Knowledge Check 6

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

explosive	heat sources	shipping papers	substances
center	fixed	portable	deck
magazines			

1. Part 176, Subpart G, provides detailed requirements for carrying Class 1 (_____) materials by vessel.

2. According to the general stowage conditions described in 176.116, Class 1 (explosive) materials must be stowed away from all _____ _____ including steam pipes, heating coils, sparks, and flames.

3. A copy of the _____ and certification must be provided to the vessel's representative for any transport vehicle containing hazardous materials that is to be carried on board a ferry vessel.

4. Many explosive _____ must be stowed in magazines.

5. Class 1 (explosive) material stowed on deck must be carried close to the vessel's _____ line and must not be stowed within 20 feet of any potential sources of ignition.

The correct answers are: 1) explosive; 2) heat sources; 3) shipping papers; 4) substances; 5) center

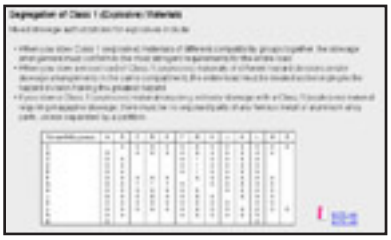
63

In general, you must segregate Class 1 (explosive) materials from other packaged hazardous materials in accordance with §176.83. Click on each button to learn about these segregation requirements.

64

You may not transport certain extremely flammable hazardous materials in a vessel carrying Class 1 (explosive) materials. These prohibited materials are listed in §176.142.

65



§176.144 contain this table showing authorized mixed stowage for explosives within the same compartment, magazine, portable magazine, or transport unit. Exceptions to this table are found in §176.145.

66

With the exception of mail, baggage, and personal and household effects, you need not segregate Class 1 (explosive) materials from non-dangerous cargo. Explosives with a secondary hazard of POISON or CORROSIVE must be separated from all foodstuffs.

67

You must take specific precautionary measures involving artificial lighting, radio and radar use, fueling, security, fire precautions and firefighting during the loading and unloading of Class 1 (explosive) materials. Click each button to learn more.

68

Electric lights, except arc lights, are the only form of artificial lighting permitted.

69

You must de-energize sources of electromagnetic radiation, such as radio and radar transmitters, or remove them to the distances specified in 176.150

70

Vessels may not be fueled (bunkering) during loading or unloading, and fueling (bunkering) may not take place with the hatches open unless authorized by the COTP.

71

You may not accept defective packages containing Class 1 (explosive) materials for shipment. You must set aside any defective package for examination and repair, or legal disposal, as directed by the shipper. You may not repair these packages on board a vessel. In case of spillage, the appropriate emergency response must be taken as required under 172.602 and reported to the COTP as soon as possible.

72

The carrier must take adequate measures to prevent packages from becoming wet due to weather.

73

A responsible person must be present at all times when the hatches of spaces containing Class 1 (explosive) materials are open, and no unauthorized entry may be permitted.

74

Sources of fire are prohibited on or near any vessel during loading or unloading. No repair work involving fire, flame, spark, or arc-producing equipment may be conducted on board except in an emergency and, if in a port, when authorized by the COTP. A fire hose long enough to reach every part of the loading area must be laid and connected to the water main, ready for immediate use. Each compartment containing Class 1 (explosive) materials must have a fixed fire extinguishing system. Adjacent compartments must have the same type system or be accessible for firefighting operations.

75

Professor Fed's Knowledge Check 7

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

dangerous	entry	exit	fire
flammability	loaded	non-hazardous	segregated
smoke	volatility		

1. Class 1 (explosive) materials must be _____ from other packaged hazardous materials in accordance with §176.83.

2. Class 1 (explosive) materials and certain hazardous materials of extreme _____ may not be transported on the same vessel.

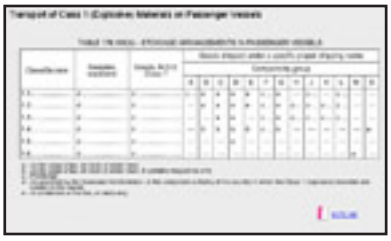
3. Class 1 (explosive) materials do not need to be segregated from other _____ cargo except for mail, baggage, and personal and household effects.

4. During loading and unloading of Class 1 (explosive) materials, sources of _____ are prohibited on or near the vessel.

5. No unauthorized _____ may be permitted into spaces containing Class 1 (explosive) materials.

The correct answers are: 1) segregated; 2) flammability; 3) non-hazardous; 4) fire; 5) entry

76



You may not transport certain extremely flammable hazardous materials in a vessel carrying Class 1 (explosive) materials. These prohibited materials are listed in §176.142.

77

Transport vehicles carrying Class 1 (explosive) materials must be properly secured and meet the structural serviceability requirements in §176.172. You must stow Class 1 (explosive) materials of different compatibility groups except as allowed under §176.144, and vehicles must be separated from each other as provided in §176.144.

78

Freight containers carrying Class 1 (explosive) materials may be transported on vessels only under the conditions listed here.

79

Special handling is required for Class 1 (explosive) materials while in port. Some of these special requirements involve the use of signals, mooring lines and watchkeeping. Click each button to learn more.

80

When loading, handling, or unloading Class 1 (explosive) materials in port, the vessel must exhibit a “B” (Bravo) of the international code of signals by day, and an all-round fixed red light by night.

81

Mooring lines must be of sufficient strength, type, and number for the size of the vessel and local conditions. The mooring arrangements must be such that the vessel can be released quickly in an emergency. While in port, towing wires of adequate size and length must be properly secured at the bow and stern, ready for immediate use.

82

When in port, a vessel carrying Class 1 (explosive) materials must have sufficient crew on board to maintain a proper watch and to operate the propulsion and firefighting equipment in case of an emergency.

83

Class 1 (explosive) materials must not be handled on board a vessel during electrical storms or other weather conditions that may increase the hazards of the Class 1 (explosive) materials; during hours of darkness unless prior consent has been obtained from the COTP; in insufficient lighting to safely perform the handling operation; or by a person impaired by the influence of alcohol or drugs. In addition, smoking is prohibited on the vessel while Class 1 (explosive) materials are being handled or stowed except in places designated by the master of the vessel, and No Smoking signs must be posted and clearly visible at all locations where Class 1 (explosive) materials are handled or stored.

84

Class 1 (explosive) materials in Compatability Group L may not be handled in any port area without special permission from, and subject to any special precautions required by, the COTP.

85

Except in an emergency, only equipment specifically designed for the handling of freight containers may be used for loading, handling, and unloading containers containing Division 1.1 or 1.2 (explosive) materials. The gross weight of the freight container containing Class 1 (explosive) materials may not exceed the safe working load for the handling gear.

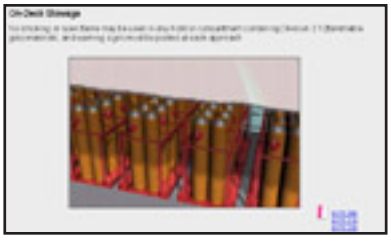
86

§176.194 describe the special requirements for the stowage of Class 1 (Explosive) materials on a magazine vessel. Review §176.194 for additional specifics.

87

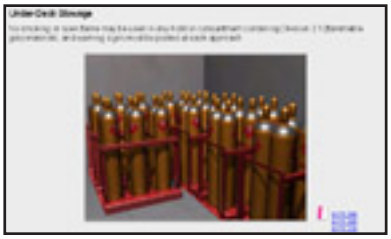
You must stow Cylinders of Class 2 (compressed gas) materials in such a way that the cylinders do not make direct contact with the vessel's deck, side, or bulwark. The carrier must keep them as cool as practicable, stow them away from all sources of heat and ignition, and keep them separate from all foodstuffs. Click each button to learn about the requirements for "on-deck" and "under-deck" stowage.

88



Cylinders of Class 2 (compressed gas) may not be stowed "on-deck" over a hold or compartment containing coal and must be protected from radiant heat, including the direct rays of the sun.

89



Cylinders of Class 2 (compressed gas) when stowed "under deck" must be mechanically ventilated with no source of artificial heat and clear of living quarters.

90

The carrier must keep Class 3 (flammable) or combustible liquids as cool as reasonably possible, and stow them away from all sources of heat and ignition. You must stow them "on deck" if they are equipped with vents or safety relief devices.

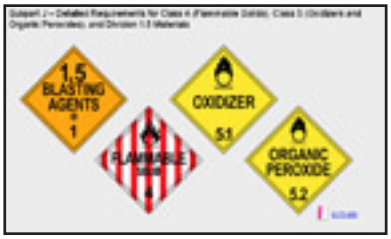
91

You must keep a dry chemical, foam fire extinguisher or a fire hose fitted with an approved portable mechanical foam nozzle accessible to the tank it is intended to cover.

92

Only flashlights suitable for use in locations where fire or explosion hazards are possible may be used. Smoking or the use of an open flame is prohibited in any hold or compartment containing Class 3 (flammable) or combustible liquid and warning signs must be posted.

93

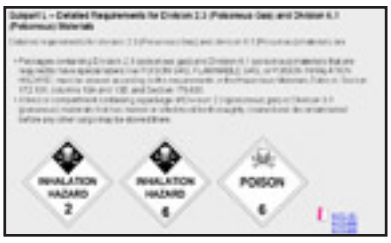


Class 4 (flammable solids) and Division 5.2 (organic peroxide) materials must also be kept cool and be stowed away from all sources of heat and ignition. You must stow Division 5.2 materials away from living quarters or access to them. You may not stow Division 1.5 or Class 5 (oxidizers and organic peroxides) in the same hold or compartment as any readily combustible material, or in or near a hold containing sulfur in bulk.

94

You must follow special provisions and procedures when transporting Division 1.5, ammonium nitrate, and ammonium nitrate mixtures. Review §176.410 to learn more about these requirements. Under certain circumstances, written permission from the nearest COTP is necessary before Division 1.5, ammonium nitrates, and certain ammonium nitrate fertilizers may be loaded on or unloaded from a vessel at any waterfront facility. §176.415 detail these requirements.

95

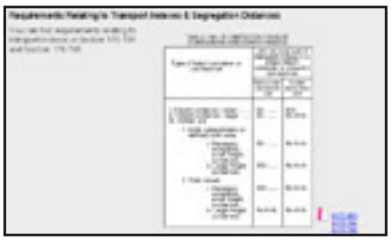


You must stow each package required to have a POISON GAS, POISON INHALATION HAZARD, or POISON label clear of living quarters and any ventilation ducts serving living quarters. You must also separate such packages from foodstuffs, except when the hazardous materials and the foodstuffs are in different closed transport units.

96

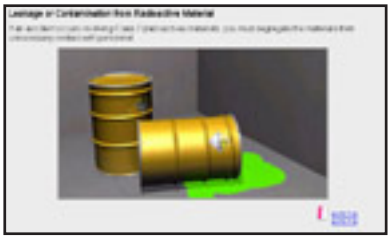
No person may remain unnecessarily in a hold or compartment, or in the immediate vicinity of any package on deck containing radioactive materials. A package of radioactive materials with a surface temperature of more than 5°C (9°F) above the ambient air may not be overstowed with any other cargo. If the package is stowed under deck, the hold or compartment must be ventilated.

97



Certain packages of Class 7 (radioactive) materials should be marked with transport indexes. The sum of these indexes may not exceed the limits specified.

98



If an accident occurs involving Class 7 (radioactive) materials, you must segregate the materials from unnecessary contact with personnel. If the package has leaked, you must isolate the hold or compartment containing the cargo. Do not use the hold or compartment for any other cargo until it has been decontaminated in accordance with §176.715.

99

General stowage requirements for Class 8 (corrosive) materials are found in §176.800 and include prohibitions against stowing these materials near living quarters, foodstuffs, combustible materials or cotton.

100

When you stow break bulk Class 8 materials on deck, you must make provisions in case of leakage. Dunnage must be provided on the deck and arranged so that any leakage will be apparent. You must wash down any leakage using liberal quantities of water.

101

Cotton and vegetable fibers that are transported on a vessel must be securely baled and bound. Each bale must be covered with bagging on at least three-fourths of its surface. You must stow each bale of wet cotton separately from dry bales of cotton or vegetable fiber.

102

Professor Fed's Knowledge Check 8

Instructions: Click and drag the response to the blank line that correctly answers the question asked. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

172.101	176.166	crew	drink
blue light	foodstuffs	magazine	truck
red light	fire extinguishers		

1. Special restrictions that apply to Class 1 (explosive) materials being transported on passenger vessels are found in _____.

2. Freight containers may be regarded as a _____.

3. A vessel handling Class 1 (explosive) materials in port must exhibit a "B" (Bravo) flag by day and an all-round _____ by night.

4. A vessel in port must have sufficient _____ on board to maintain a proper watch if it is carrying Class 1 (explosive) material.

5. Class 8 (corrosive materials) must be stowed away from living quarters and _____.

103

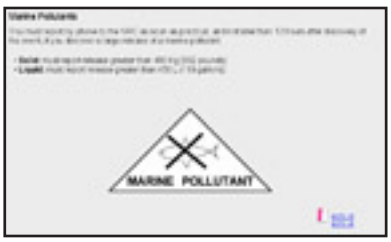
Despite all safety efforts, incidents do occur. When hazardous materials are involved in a transportation incident, a report may be required. For certain incidents, you must notify either the National Response Center (NRC) or, for infectious substances, the Centers for Disease Control (CDC), as soon as practical, but not later than 12 hours after the incident occurs. For any such incident, you must also follow up with a written Hazardous Materials Incident Report. Click each button below to learn more.

You must also file a written Hazardous Materials Incident Report within 30 days of discovering any unintentional release of hazardous materials or unintentional discharge of hazardous waste, as well as under certain other conditions. (see the guidelines in 171.16). But unless a requirement listed in 171.15 applies, you do not need to notify the NRC or CDC by phone.

104

You must notify the NRC as soon as practical in the event of fire, breakage, spillage, or suspected radioactive contamination from a radioactive material.
You must notify the CDC as soon as practical in the event of fire, breakage, spillage, or suspected contamination involving an infectious substance other than a diagnostic specimen or regulated medical waste.

105



You must report a large release of a marine pollutant, by phone, as soon as possible, to the NRC. This requirement applies to a release of over 400 kilograms of a solid, and to the release of over 450 liters of a liquid.

106

Hazmat incidents that result in any of the following require notification as soon as possible to the National Response Center or the Center for Disease Control, if applicable, when due to the hazardous materials:

- death or injury requiring hospitalization,
- change in the operational flight pattern or routine of an aircraft,
- the shutdown of a major facility or transportation artery for more than one hour,
- an evacuation of the general public that lasts more than one hour, or
- a situation that, in your judgment, requires notification, even if none of the above conditions are met – for example, a continuing danger to life, although no death has yet occurred.

107

Professor Fed's Knowledge Check 9

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which one of the following results of a hazmat incident is **NOT** required to be reported to the nearest NRC or the Center for Disease Control within 12 hours?

A. Death, or injury requiring hospitalization
B. Damage to any facility requiring in-service repair
C. Suspected radioactive contamination
D. Shutdown of major facility or transportation artery

108

After completing Module 6D on the Carrier Requirements for the Water lesson, you should be able to:

- Summarize general operating requirements, as well as general handling, stowage, and segregation requirements for transporting hazardous materials by commercial vessels.
- Define special requirements for transport vehicles and barges.
- Recognize segregation requirements for specific classes of hazardous materials and highlight any exceptions to those requirements.
- Compare the uses of the International Maritime Dangerous Goods Code for similarities to and differences from the uses of the hazardous materials regulations.
- Identify and apply the incident reporting requirements in 49 CFR.

It is now time to assess how well you understand the information presented in this module. When you are ready, select Test on the Express Lane, to begin the end of module test for Module 6D. This will be an open reference test. Good luck.

End of Module Test

Now that you have completed reviewing the topic on Carrier Requirements for Water, let's evaluate how well you have mastered this material. This end of module test contains seventeen multiple-choice questions to determine your mastery of the five learning objectives covering Carrier Requirements for Water. This is an open reference book test and you may use any of the references that you have to assist you in successfully completing this test.

Instructions: Select the best answer from the four choices provided.

Question #1

Regulations for carrying hazardous material by vessel are found in 49 CFR, _____.

A. Part 173
B. Part 176
C. Part 172
D. Part 178

Question #2

The person responsible for packing or loading a freight container loaded with packages must provide a signed container packing certificate stating that _____.

A. the packages will be inspected once loaded
B. damaged packages are placarded "DAMAGED"
C. the packages are properly marked, labeled, or placarded, as applicable
D. all packages meet all the requirements of both the CFR and the IMDG code (only one of the two is not acceptable)

Question #3

Which of the following items would NOT be listed on a dangerous cargo manifest, list, or stowage plan document?

A. The number and description of packages in the cargo
B. The stowage location of the hazardous material on board the vessel
C. The classification of the hazardous materials
D. All of the above are required to be listed on a dangerous cargo manifest, list, or stowage plan document

Question #4

A carrier may NOT transport by vessel which of the following packages?

A. A package that has been repaired to the satisfaction of the master of the vessel
B. A package that is radioactive
C. A package that is unable to contain its contents
D. A carrier may not transport any of the above packages

Question #5

An inspection of a compartment or hold containing hazardous material must be performed:

A. At least once every 24 hours
B. Before stowage
C. At least once every 12 hours
D. During periods of heavy weather

Question #6

The dangerous cargo manifest must contain:

A. Name of the vessel and official number
B. Nationality of the vessel
C. Stowage location of hazardous material on board vessel
D. All of the above

Question #7

When hazardous materials are stowed together, they must be segregated according to the:

A. General Segregation Table, 176.83(b)
B. Hazardous Material Table
C. Captain of the Port (COTP)
D. A. and B.

Question #8

Repairs involving welding, burning, and power actuated tools and appliances that may produce intense heat may not be done on a vessel that has explosives or other hazardous material on board unless:

A. Performing emergency repairs to the vessel's main propelling or boiler plant or auxiliaries is for safety purposes
B. Work is being performed under approval from the Captain of the Port
C. Repair work is being done on damaged packages of hazardous materials
D. A. and B.

Question #9

When carrying freight containers loaded with packages of hazardous materials by vessel:

A. All packages in the container must be secured to prevent movement in any direction
B. The weight in the container must be evenly distributed
C. All hazardous materials must be contained entirely within the freight container
D. All of the above

Question #10

Detailed requirements for Class 1 (Explosive) materials are found in Part 176, Subpart:

A. E
B. F
C. G
D. H

Question #11

When loading or unloading Class 1 (Explosive) materials:

A. A combination of woven rope and wire sling may be used
B. Unpalletized packages may be slid over a deck
C. Only safety hooks or a hook that has been closed by wire may be used
D. Packages may be lifted over other hazardous material

Question #12

General stowage conditions for Class 1 (Explosive) material include:

A. They must be stowed away from heat sources or all other sources of ignition
B. All compartments must remain locked or secured to prevent unauthorized entry
C. Stowage spaces must be dry
D. All of the above

Question #13

Magazine stowage is required for:

A. Most explosive substances
B. Most explosive articles
C. Most hazardous materials
D. Most chemical hazards

Question #14

When loading or unloading Class 1 (Explosive) materials:

A. Arc lights are the only form of lighting permitted
B. Radio and radar transmitters may be used with the approval of the COTP
C. Vessels may not be fueled with the hatches open, unless authorized by the COTP
D. All of the above

Question #15

When in port, a vessel containing Class 1 (Explosive) materials must:

A. Fly an A (Alpha) flag
B. Have mooring arrangements that can be released quickly in an emergency
C. Have a flashing red light, whether during the day or at night
D. B. and C.

Question #16

If an accident occurs on board a vessel carrying hazardous materials:

A. The hazardous material may be jettisoned if the Master of the Vessel believes this action is necessary to prevent or reduce hazard to human life and property
B. The Master of the Vessel may determine the disposition of the packages
C. Damaged packages may be contained in unauthorized packaging units until it can be forwarded to another carrier for transportation
D. All of the above.

Question #17

In addition to notifying the NRC or the CDC by phone, and following up with a written report, in the event of certain hazardous materials incidents you must also notify the shipper (offeror) of the material in the case of:

A. Infectious substances
B. Radioactive materials
C. Death or injury requiring hospitalization
D. It is not necessary to notify the shipper (offeror) of an incident when transporting hazardous materials by vessel.